(19) World Intellectual Property Organization International Bureau



🕽 I COLIC BULGOLI I COLICO COLIC COLIC

PCT

(10) International Publication Number WO 2006/051361 A1

(43) International Publication Date 18 May 2006 (18.05.2006)

- (51) International Patent Classification: F16F 15/023 (2006.01)
- (21) International Application Number:

PCT/IB2005/003015

- (22) International Filing Date: 11 October 2005 (11.10.2005)
- (25) Filing Language:

English

(26) Publication Language:

English

- (30) Priority Data: 2004-297391 12 October 2004 (12.10.2004)
- (71) Applicant (for all designated States except US): NISSAN
- (71) Applicant (for all designated States except US): NISSAN MOTOR CO., LTD. [JP/JP]; 2, Takara-cho, Kanagawa-ku, Yokohama-shi, Kanagawa-ken 221-0023 (JP).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): NAKAJIMA, Tsuyoshi [JP/JP]; 3-1-12 Soubudai, Sagamihara-shi, Kanagawa 228-0824 (JP).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

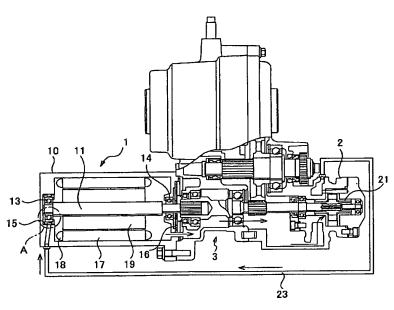
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: VIBRATION DAMPING FOR A ROTATING SHAFT



(57) Abstract: The invention provides damping techniques for a rotating shaft (11). The rotating shaft is supported by rotary bearings (13). The damping techniques control vibration of the rotating shaft by creating a fluid film in a support element of the rotating shaft. For example, the fluid film may be created between a housing and the rotary bearings. The fluid may be supplied by a pump (2), and the supply amount of fluid to create the fluid film is relative to the rotational velocity of the shaft. Vibration can be prevented for every operational rotational velocity of the rotating shaft. In some embodiments, the rotating shaft may be powered by or part of an electric motor for a vehicle.